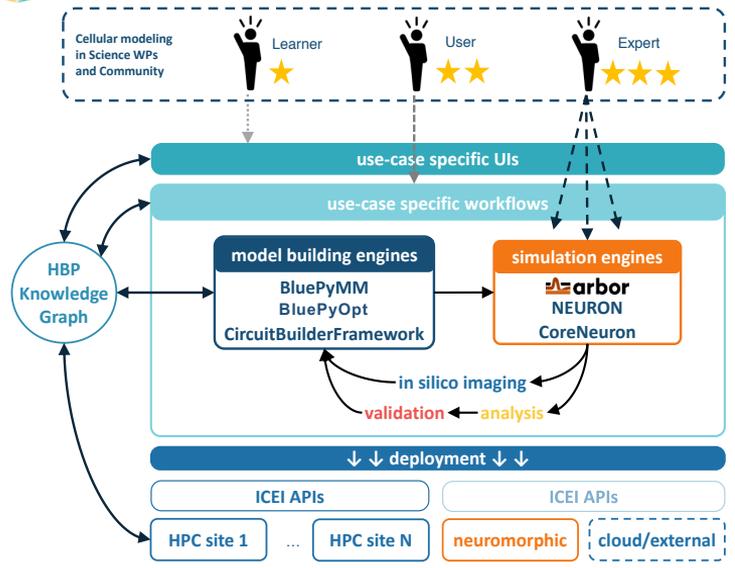
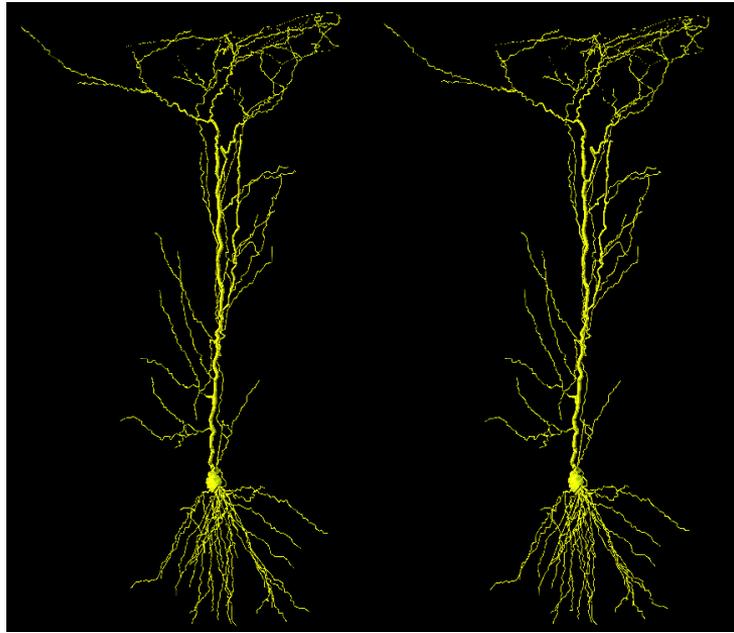


Brain modeling and simulation workflows in the EBRAINS Platform: Integrated tools to create and investigate models of the brain

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All activities for average users through web browser
NO download/installation/HPC account required



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Molecular Level	
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Brain Simulation Platform
Monitor

HPC Status Monitor

Online Use Cases

Molecular Level

Subcellular Level

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Morphology Analysis

Single Cell Building

Circuit Building

Single Cell In Silico
Experiments

Small Circuit In Silico
Experiments

Brain Area Circuit In Silico
Experiments

Please select a use case

- Hodgkin-Huxley Neuron Builder**
Use the eFEL and BluePyOpt libraries to go through the entire neuron builder pipeline: 1) feature extraction, 2) model optimization, 3) simulation.
Credits: Luca Leonardo Bologna - l.uceleonardo@bologna.cnr.it
- Rebuild an existing single hippocampal cell model**
Use the BluePyOpt to re-run an optimization with your choices for the parameters range.
Credits: Carmen Aline Lupescu - carmen.lupescu@epi.ifi.cnz.it / Roberto Smiraglia - roberto.smiraglia@epi.ifi.cnz.it / Luca Leonardo Bologna - l.uceleonardo@bologna.cnr.it
- Build your own single hippocampal cell model using HBP data**
Use the BluePyOpt to run an optimization choosing from HBP data for morphology, channel kinetics, features, and parameters.
Credits: Carmen Aline Lupescu - carmen.lupescu@epi.ifi.cnz.it / Roberto Smiraglia - roberto.smiraglia@epi.ifi.cnz.it / Luca Leonardo Bologna - l.uceleonardo@bologna.cnr.it
- Mono compartmental Cerebellar Granule cell optimization**
Use BluePyOpt to optimize a single compartmental cerebellar granule cell. All the parameters, channels and morphology can be modified. This version runs directly on the collaboratory and it is limited to small optimizations.
Credits: Stefano Masoli - stefano.masoli@univr.it / Martina Rizzi - martina.rizzi@univr.it
- Multi compartmental Cerebellar Granule cell optimization**
Use BluePyOpt to optimize a multicompartmental cerebellar granule cell composed by four dendrites, soma and a custom multi segmented axon. All the parameters, channels and morphology can be modified. This version runs directly on the collaboratory and it is limited to small optimizations.
Credits: Stefano Masoli - stefano.masoli@univr.it

Run in silico experiments

The interface shows a 3D model of a neuron on the left and a circuit diagram on the right. The circuit diagram includes a table for 'Cells added for simulation' and a 'Connectivity filter' section. The 3D model is color-coded by type, with a legend at the bottom showing SAC (pink), LAC (green), LACsp (blue), and LAMC (purple).

The interface shows a 'Reports' section at the top, a 'Connection Manipulation' section, and a 'Projection Manipulation' section. A 'Configure HPC job' dialog box is open, showing fields for 'Title', 'Computer' (JUREKA), 'Nodes' (3), and 'RunTime (sec)' (3600). There are 'Edit' and 'Cancel' buttons.

The interface shows a 'Simulation: LFP Simulation' status as 'SUCCESSFUL'. Below it, there is an 'Analysis' section with a 'Default Analysis' entry. Three plots are displayed: 'Peristimulus Time Histogram' (a line graph of mean firing rate vs time), 'Spike Raster Plot' (a heatmap of spikes vs time and cell ID), and 'Trace Plot of Report' (multiple time-series plots for different cell IDs).

View results

The EBRAINS website features a 'Welcome to EBRAINS' message and a navigation menu with buttons for 'Find Data', 'Share Data', 'Brain Atlases', 'Brain Simulation Platform', 'The Virtual Brain', and 'Neurorobotics Platform'.



THANK YOU!



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For a free account to access and run all use cases contact support@humanbrainproject.eu

